AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A detection system including a detection cell ~~(1)~~ having an entry gate ~~(3)~~, the system including drive means ~~(10)~~ for controlling switching of the gate, ~~characterised in that~~ wherein the drive means ~~(10)~~ is arranged to control switching of the gate ~~(3)~~ in a pseudorandom binary sequence.

2. (Currently Amended) A detection system according to Claim 1, ~~characterised in that~~ wherein the pseudo-random binary sequence is bit-flipped to reduce noise.

3. (Currently Amended) A detection system according to Claim 1 ~~or 2~~, ~~characterised in that~~ wherein the output is ~~analysed~~ analyzed by matrix algebra.

4. (Currently Amended) A detection system according to claim 1, ~~any one of the preceding claims, characterised in that~~ wherein the system is arranged to carry out deconvolution on the cell output using matrix algebra.

5. (Currently Amended) An IMS detection system according to claim 1, ~~any one of the preceding claims, characterised in that~~ wherein the cell ~~(1)~~ has a drift region ~~(4)~~ and that the gate ~~(3)~~ is arranged to control entry to the drift region.

6. (Currently Amended) A method of controlling switching of an admittance gate ~~(3)~~ in a detection system, ~~characterised in that~~ wherein the gate ~~(3)~~ is switched in a pseudo-random binary sequence.

7. (Currently Amended) A method according to Claim 6, ~~characterised in that~~ wherein the pseudo-random binary sequence is bit-flipped.

8. (Currently Amended) A method according to Claim 6 ~~or 7~~, ~~characterised in that~~ wherein the method includes ~~analysing~~ analyzing an output using matrix algebra.

9. (Currently Amended) A method according to claim 6, ~~any one of Claims 6 to 8, characterised in that~~ wherein the method includes deconvolution of the output using matrix algebra.